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PEDCo-ENVIRONMENTAL
SUITE 8 • ATKINSON SQUARE
CINCINNATI, OHIO 45246
513/771-4330

PB 205 469

FINAL REPORT
GRIDDED MOTOR VEHICLE EMISSIONS
FOR
KANSAS CITY AIR QUALITY
CONTROL REGION

Prepared for:

The Environmental Protection Agency
Durham, North Carolina 27701

Authorization:

Contract No. 68-02-0044
Task Order No. 4

Prepared by:
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16. Abstracts

Motor vehicle emissions for the Kansas City Interstate Air Quality Control Region are distributed over nine counties. These emissions have been apportioned among 202 grids based on available vehicle-mile data (Kansas urban grids and Missouri rural and urban grids) and estimates of relative motor vehicle emissions (Kansas rural grids). Gridded emissions are tabulated for particulate, sulfur oxides, carbon monoxide, hydrocarbons, and nitrogen oxides in tons per year.

17. Key Words and Document Analysis. 17a. Descriptors

Air pollution
Motor vehicles
Exhaust emissions
Urban areas
Rural areas
Particles
Sulfur oxides
Carbon monoxide
Hydrocarbons
Nitrogen oxides
Inventories

17b. Identifiers/Open-Ended Terms

17c. COSATI Field/Group 13B

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1.0 SUMMARY

Motor vehicle emissions for the Kansas City Interstate Air Quality Control Region are distributed over nine counties. These emissions have been apportioned among the 202 grids based on available vehicle-mile data (Kansas urban grids and Missouri rural and urban grids) and estimates of relative motor vehicle emissions (Kansas rural grids).

Gridded emissions are given in the following ten pages.

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
1	1	335	4405	3.1	2.5	778	136	99
4-D	4-D[b]	340	4400	99.0	75.0	21 300	3 830	2 980
6	6	350	4400	13.1	10.0	3 110	540	395
7	7	330	4390	4.5	3.4	1 060	185	135
10-D	10-D[c]	340	4390	25.5	19.2	5 830	1 027	769
12	12	350	4390	9.0	6.9	2 150	374	273
13	13	320	4380	9.4	7.2	2 230	387	283
14	14	330	4380	3.1	2.4	738	129	94
15	15	340	4380	27.1	20.8	6 450	1 120	820
16	16	350	4380	1.9	1.5	450	78	57
17	17	320	4370	1.1	0.9	257	45	34
18	18	330	4370	1.1	0.9	257	45	34
19	19	340	4370	3.5	2.7	809	142	107
20	20	350	4370	3.6	2.8	833	146	110
76-B	21-B[d]	400	4370	0.1	0.1	28	4	4
78-B	23-B[e]	410	4370	1.5	1.1	314	56	44
79-B	24-B[f]	420	4370	0.2	0.2	49	8	7
81	26	430	4370	0.1	0.1	14	2	2
	30-B[g]	310	4360	3.3	2.5	534	105	104
	32-B[h]	320	4360	4.4	3.4	712	140	139
23-D	34-D[i]	330	4360	4.7	3.6	1070	188	142

a) Missouri portion of the AQCR only.
b) Includes nos. 2, 3, 4, & 5
c) Includes nos. 8, 9, 10, & 11
d) Includes nos. 21 & 22
e) Includes nos. 23 & 29
f) Includes nos. 24 & 29
g) Includes nos. 30 & 31
h) Includes nos. 32 & 33
i) Includes nos. 27, 28, 34, & 35

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
25	36	340	4360	23.1	17.5	5280	925	698
26	37	350	4360	0.8	0.6	192	34	25
45	38	360	4360	7.1	5.4	1660	289	209
46	39	370	4360	5.3	4.1	1260	219	158
47	40	380	4360	8.3	6.3	1950	340	246
48	41	390	4360	24.2	18.5	5700	992	717
82	42	400	4360	3.1	2.3	665	119	93
83	43	410	4360	2.5	1.9	551	93	77
84	44	420	4360	1.7	1.3	359	64	50
86-B	46-B[b]	430	4360	0.7	0.5	146	26	20
	47	310	4350	7.0	5.3	1135	224	222
	48	320	4350	9.5	7.2	1540	303	300
	49	330	4355	1.1	0.8	178	35	35
27	50	335	4355	1.3	1.0	291	51	39
	51	330	4350	1.1	0.8	178	35	35
28	52	335	4350	0.4	0.3	98	17	13
29	53	340	4350	7.6	5.7	1730	304	229
32-D	60-D[c]	350	4350	7.6	5.7	1730	304	229
53-D	62-D[d]	360	4350	10.5	8.1	2490	433	313
55-D	64-D[e]	370	4350	10.5	8.1	2490	433	313
57	66	380	4350	10.5	8.1	2490	433	313

a) Missouri portion of the AQCR only.
b) Includes nos. 45 & 46
c) Includes nos. 54, 55, 60, & 61
d) Includes nos. 56, 57, 62, & 63
e) Includes nos. 58, 59, 64, & 65

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
58	67	390	4350	10.5	8.1	2490	433	313
87	68	400	4350	8.7	6.6	1890	337	263
88	69	410	4350	2.6	2.0	561	100	78
89	70	420	4350	1.7	1.3	376	67	52
91-B	72-B[b]	430	4350	0.9	0.7	204	36	28
	73	310	4340	9.5	7.2	1540	303	300
	74	320	4340	9.5	7.2	1540	303	300
61	83	370	4345	2.6	2.0	615	107	77
68	84	375	4345	1.7	1.3	417	73	51
	85-D[c]	330	4340	9.5	7.2	1540	303	300
38-D	87-D[d]	340	4340	7.6	5.7	1730	304	229
40-D	89-D[e]	350	4340	15.6	11.8	3650	637	464
62-D	91-D[f]	360	4340	32.2	24.5	7808	1339	944
64	93	370	4340	1.7	1.3	417	73	51
65	94	375	4340	1.7	1.3	417	73	51
66	95	380	4340	14.1	10.8	3320	579	418
67	96	390	4340	14.1	10.8	3320	579	418
92	97	400	4340	2.7	2.1	583	104	82
95-D	100-D[g]	410	4340	4.8	3.6	1036	185	145
97	102	420	4340	10.6	8.1	2290	410	321
99-B	104-B[h]	430	4340	2.3	1.8	496	88	69

a) Missouri portion of the AQCR only.
b) Includes nos. 71 & 72
c) Includes nos. 75, 76, 85, & 86
d) Includes nos. 77, 78, 87, & 88
e) Includes nos. 79, 80, 89, & 90
f) Includes nos. 81, 82, 91, & 92
g) Includes nos. 98, 99, 100, & 101
h) Includes nos. 103 & 104

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
	105	310	4330	9.5	7.2	1540	303	300
	106	320	4330	9.5	7.2	1540	303	300
	109	340	4335	3.7	2.8	620	120	117
42	110	345	4335	0.8	0.6	130	25	25
43	111	350	4335	0.8	0.6	130	25	25
44	112	355	4335	0.8	0.6	130	25	25
69	113	360	4335	37.6	28.6	9010	1570	1110
70	114	365	4335	43.3	32.9	10370	1800	1270
71	115	370	4335	2.9	2.2	695	121	85
72	116	375	4335	2.6	2.0	615	107	77
73	117	380	4335	2.6	2.0	615	107	77
103	118	385	4335	2.7	2.1	624	110	81
	119-D[b]	330	4330	13.3	10.0	2284	442	418
	121	340	4330	7.4	6.3	1562	282	224
	122	345	4330	21.7	16.5	5300	918	648
	123	350	4330	28.7	21.9	7010	1220	857
	124	355	4330	60.7	46.2	14800	2570	1810
	125	360	4333	7.3	5.5	1900	314	228
177	126[c]	362	4333	1.5	1.2	300	54	45
178	127[c]	364	4333	9.3	7.0	1500	299	292
179	128	366	4333	1.4	1.1	334	58	41

a) Missouri portion of the AQCR only.
b) Includes nos. 107, 108, 119, & 120
c) Original data in error; Emissions are based on judgement and are relative to surrounding grids.

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
180	129	368	4333	0.6	0.4	139	24	17
	130	360	4331	13.4	10.2	3200	566	394
181	131	362	4331	3.0	2.3	723	126	89
182	132	364	4331	5.9	4.5	1420	246	174
183	133	366	4331	2.1	1.6	500	87	61
184	134	368	4331	2.8	2.1	667	116	82
185	135	360	4329	44.0	33.4	10560	1830	1300
186	136	362	4329	53.7	40.9	12870	2240	1580
187	137	364	4329	20.4	15.5	4890	850	600
188	138	366	4329	14.6	11.1	3500	609	430
189	139	368	4329	4.6	3.5	1110	193	136
190	140	360	4327	2.8	2.1	667	116	82
191	141	362	4327	27.1	20.7	6510	1130	798
192	142	364	4327	22.5	17.1	5390	937	662
193	143	366	4327	10.9	8.3	2610	454	321
194	144	368	4327	12.5	9.5	3000	522	368
195	145	360	4325	4.5	3.4	1080	188	133
196	146	362	4325	23.2	17.7	5560	966	682
197	147	364	4325	8.5	6.5	2030	353	249
198	148	366	4325	11.0	8.4	2640	459	324
199	149	368	4325	7.5	5.7	1810	314	222

a) Missouri portion of the AQCR only.

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
74	150	370	4330	6.6	5.0	1590	275	194
75	151	375	4330	2.7	2.1	624	110	81
104	152	380	4330	2.7	2.1	624	110	81
105	153	385	4330	2.7	2.1	624	110	81
106	154	390	4330	16.3	12.4	3770	662	489
100	155	400	4330	3.4	2.6	730	130	102
101-B	156-B[b]	410	4335	0.1	0.1	28	4	4
107	158	420	4335	3.5	2.7	762	136	106
	159	310	4320	14.0	11.6	2270	446	442
	160	320	4320	14.0	11.6	2270	446	442
	163	340	4325	3.8	2.9	643	125	120
	164	345	4325	8.8	6.7	2140	371	262
	165	350	4325	22.7	17.3	5550	962	678
	166	355	4325	71.9	54.8	17540	3040	2150
	167-D[c]	330	4320	38.1	28.8	7920	1437	1163
	169	340	4320	4.8	3.7	898	168	151
	170	345	4320	2.0	1.5	487	84	60
	171	350	4320	21.6	16.4	5250	911	643
	172	355	4320	59.0	44.9	14390	2490	1760
108	173	360	4320	155.4	118.3	37340	6490	4574
109	174	365	4320	120.2	91.5	28800	5000	3530

a) Missouri portion of the AQCR only.
b) Includes nos. 156 & 157
c) Includes nos. 161, 162, 167, & 168

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION

1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
110	175	370	4325	40.3	30.6	9650	1680	1180
111	176	375	4325	40.3	30.6	9650	1680	1180
112	177	380	4325	40.3	30.6	9650	1680	1180
113	178	385	4325	12.6	9.7	2930	513	379
114	179	370	4320	58.9	44.9	14120	2450	1730
115	180	375	4320	4.9	3.7	1170	203	143
116	181	380	4320	4.9	3.7	1170	203	143
117	182	385	4320	12.6	9.7	2930	513	379
118	183	390	4320	50.5	38.5	11680	2050	1510
120-B	185-B[b]	400	4320	1.8	1.4	204	36	27
	186-B[c]	310	4315	2.2	1.6	356	70	69
	190-D[d]	320	4310	9.2	6.9	1490	294	291
	192	330	4310	9.2	6.9	1490	294	291
	193	340	4315	3.6	3.5	882	164	141
	194	345	4315	8.3	6.3	1750	315	254
	195	350	4315	30.4	23.1	7410	1290	906
	196	355	4315	65.8	50.1	16060	2780	1960
121	197	360	4315	67.6	51.5	16270	2828	1992
122	198	365	4315	79.6	60.6	19070	3310	2340
123	199	370	4315	48.1	36.7	11540	2010	1420
124	200	375	4315	15.8	12.0	3780	657	464

a) Missouri portion of the AQCR only.
b) Includes nos. 184 & 185
c) Includes nos. 186 & 187
d) Includes nos. 188, 189, 190, & 191

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
125	201	380	4315	2.4	1.9	561	99	73
126	202	385	4315	2.4	1.9	561	99	73
	203	340	4310	2.8	2.1	451	89	88
	204	345	4310	11.5	8.8	2520	450	349
	205	350	4310	7.8	5.9	1890	328	231
	206	355	4310	29.0	22.1	7060	1220	864
127	207	360	4310	44.8	34.2	10790	1878	1326
128	208	365	4310	29.2	22.3	7010	1220	859
129	209	370	4310	14.3	10.9	3420	594	419
130	210	375	4310	2.4	1.9	561	99	73
131	211	380	4310	2.4	1.9	561	99	73
132	212	385	4310	16.2	12.4	3750	658	486
133	213	390	4310	64.3	49.1	14890	2610	1930
135-B	215-B[b]	400	4310	10.0	7.6	1700	299	221
	218-D[c]	320	4300	9.2	6.9	1490	294	291
	220	330	4300	9.5	7.2	1540	303	300
	223	350	4305	5.4	4.0	928	179	169
	224	355	4305	7.3	5.5	1506	275	224
136	225	360	4305	14.7	11.2	3530	613	433
137	226	365	4305	19.1	14.6	4590	797	563
138	227	370	4305	6.2	4.7	1470	256	181

a) Missouri portion of the AQCR only.
b) Includes nos. 214 & 215
c) Includes nos. 216, 217, 218, & 219

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION

1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
139	228	375	4305	2.4	1.9	561	99	73
	231-D[b]	340	4300	18.2	13.7	2940	580	573
	233	350	4300	4.2	3.2	680	134	133
	234	355	4300	2.8	2.0	452	89	88
142	235	360	4300	2.4	1.9	561	99	73
143	236	365	4300	6.4	4.9	1530	266	188
144	237	370	4300	2.4	1.9	561	99	73
145	238	375	4300	2.4	1.9	561	99	73
146-D	239-D[c]	380	4300	9.8	7.4	2260	396	293
148	241	390	4300	20.8	15.9	4810	844	623
	242	320	4290	11.7	8.8	1890	373	369
	243	330	4290	14.0	11.6	2270	446	442
	244	340	4290	9.5	7.2	1540	303	300
	245	350	4290	14.0	11.6	2270	446	442
151-D	248-D[d]	360	4290	6.4	4.8	1360	244	194
153	250	370	4290	13.2	10.0	2800	504	400
154	251	380	4290	2.3	1.7	483	87	69
155	252	390	4290	4.6	3.5	985	177	141
156	253	360	4280	1.8	1.4	390	70	56
157	254	370	4280	16.6	12.5	3530	635	505
158	255	330	4280	0.4	0.3	93	17	13

a) Missouri portion of the AQCR only.
b) Includes nos, 221, 222, 231, & 232
c) Includes nos, 229, 230, 239, & 240
d) Includes nos, 246, 247, 248, & 249

GRIDDED MOTOR VEHICLE EMISSIONS
FOR THE
KANSAS CITY INTERSTATE AIR QUALITY CONTROL REGION
1970 Data

IBM Source No.[a]	Grid No.	Coordinates		Emissions, TPY				
		X	Y	S.P.	SO_x	CO	HC	NO_x
159	256	390	4280	2.6	2.0	549	99	79
160	257	360	4270	3.5	2.6	739	133	105
161	258	370	4270	10.1	7.7	2160	388	308
164-D	261-D[b]	380	4270	6.3	4.7	1330	240	191
166	263	390	4270	3.2	2.4	670	120	96
167	264	360	4260	3.6	2.7	766	138	110
168	265	370	4260	0.5	0.4	103	18	15
169	266	380	4260	21.1	16.0	4510	812	645
170	267	390	4260	8.1	6.2	1730	311	247
171	268	400	4260	0.2	0.2	52	9	7
172-B	269-B[c]	380	4255	1.1	0.8	237	42	34
174-B	271-B[d]	390	4255	1.1	0.8	237	42	34
176	273	400	4255	0.4	0.3	82	15	12
TOTALS				2810	2144	643 916	113 402	84 103
Appendix D[e] totals shown for comparision				2301	2134	643 073	112 909	83 760

a) Missouri portion of the AQCR only.
b) Includes nos. 259, 260, 261, & 262
c) Includes nos. 269 & 270
d) Includes nos. 271 & 272
e) See Footnote no. 2 on following page

2.0 METHODOLOGY

2.1 Kansas Portion of AQCR

2.1.1 Urban Emissions

Total urban emissions were calculated using the vehicle-mile data for the Kansas City, Kansas Urban-In-Fact Area obtained from the Kansas State Highway Commission (Appendix 1). These emissions were then apportioned among the grids which make up the Urban-In-Fact Area on the basis of proportionate carbon monoxide emissions in each grid as determined by the Traffic Count Map obtained from the Kansas State Highway Commission.[1]

2.1.2 Rural Emissions

These emissions were determined by deducting the urban emissions from the total emissions reported in Appendix D.[2] Emissions were apportioned among the rural grids by weighting each grid according to size, location of interstate expressways and proximity to the Urban-In-Fact area.

2.2 Missouri Portion of AQCR

2.2.1 Urban Emissions

Total emissions for the Kansas City, Missouri Urban-In-Fact Area were obtained from Appendix D.[2] These emissions

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1) Kansas City Area Transportation Study, 1966, Major Street Traffic.

2) Compilation of Appendix D for Kansas City Air Quality Control Region, Final Draft. PEDCo-Environmental Specialists, Inc. Cincinnati, Ohio. December 1, 1971.

were then apportioned among the grids which make up the Urban-In-Fact Area on the basis of proportionate carbon monoxide emissions in each grid as determined by the urban vehicle-mile data obtained through the Kansas City, Missouri municipal agency. This data is found in the Appendix D Report.[2]

2.2.2 Rural Emissions

Total rural emissions were obtained from Appendix D.[2] These emissions were then apportioned among the rural grids on the basis of proportionate carbon monoxide emissions in each grid as determined by the state-wide traffic count map[3] prepared by the Missouri State Highway Department. Emissions in grids without traffic counts were estimated relative to contiguous grids.

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3) 1969 Traffic Map of Missouri.

APPENDIX 1

State Highway Commission of Kansas

JOHN D. MONTGOMERY, Director of Highways
R. L. PEYTON, Assistant State Highway Director
JOHN D. McNEAL, State Highway Engineer

ROBERT P. HAGEN
Lawrence, Kansas
BOB KENT
Salina, Kansas
HENRY SCHWALLER
Hays, Kansas
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Paola, Kansas
GALE MOSS
El Dorado, Kansas
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Garden City, Kansas

STATE OFFICE BUILDING
TOPEKA, KANSAS 66612

October 14, 1971

Section 8-C
Traffic Counts

Mr. Donald J. Henz, P. E.
PEDCo-ENVIRONMENTAL
Suite 8 Atkinson Square
Cincinnati, Ohio 45260

Dear Sir:

We are transmitting a copy of the 1966 Traffic Count map for the Kansas City area as you requested.

In the table below are the miles and vehicle miles by functional classification for 1968 and 1990 from a recent highway needs study.

URBAN-IN-FACT KANSAS CITY AREA	Miles	1968 TOTAL DAILY * Vehicle Miles (1000)	ADT Vehicle Miles/Miles
Interstate	28	586	20,929
Other Freeways & Expressways	7	168	24,000
Other Principal Arterials	78	1253	16,064
Minor Arterials	114	890	7,807
Collectors	93	289	3,108
Locals	1156	766	663
	1476	3952	
		1990	
Interstate	65	2608	40,123
Other Freeways	48	1382	28,792
Other Principal Arterials	60	877	14,617
Minor Arterials	187	1266	6,770
Collectors	140	424	3,029
Locals	1668	1130	678
	2168	7687	

* per conversation w/ ED Landman — OCT 12 1971. V-M determined from traffic count map must be subtracted from these totals